# A COMPARISON OF SOME PHILIPPINE AND INDONESIAN COMMON STOCKS IN SELECTED FINANCIAL ACCOUNTING RATIOS AND SECURITIES SYSTEMATIC RISK[1]

*Eduardus Tandelilin*

*Akibat globalisasi pasar keuangan, para investor mulai mengalihkan strategi investasi ke negara-negara yang pasar keuangannya mulai berkembang* (emerging financial market). *Sudah banyak studi empirik mengenai diversifikasi internasional, namun studi-studi tersebut lebih banyak dilakukan antara negara-negara yang pasar keuangannya sudah maju, seperti Amerika Serikat dan Jepang. Studi yang sama masih terbatas untuk negara-negara yang pasar keuangannya baru berkembang, antara lain Filipina dan Indonesia.*

*Studi ini mencoba menganalisis kemungkinan kedua bursa tesebut dijadikan altenatif strategi investasi dalam konteks diversifikasi intenasional. Rasio keuangan* (financial ratio) *dan risiko sistematik* (systematic risk) *beberapa saham yang terdaftar di kedua bursa dipergunakan sebagai pembanding. Hasil studi ini menunjukkan terdapat tiga dari duapuluh rasio keuangan yang signifikan membedakan kedua bursa tersebut. Rasio-rasio tersebut adalah rasio pembayaran dividen* (dividend payout ratio), *rasio utang jangka panjang dengan total ekuitas* (long term-debt to total equity), *dan rasio harga saham dengan nilai buku* (price to book value). *Fungsi diskriminan kanonikal* (canonical discriminant function) *menunjukan variabel diskriminan* (discriminant variables) *menjelaskan 68.79 persen variasi variabel dependen (Z=Negara). Juga terdapat perbedaan yang signifikan pada risiko sistematik saham antara kedua bursa.*

*Lebih lanjut hasil studi ini menunjukkan bahwa rasio keuangan secara signifikan mempengaruhi risiko sistematik pada kedua bursa tersebut. Hasil studi ini konsisten dengan hasil penelitian sebelumnya [Hamada (1972), Beaver dan Manegold (1975), Chun dan Ramasamy (1989),*

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*Marzan (1995), Tandelilin (1996)]. Akhirnya hasil studi ini juga mendukung penelitian yang dilakukan oleh Pudjiastuti dan Husnan (1994) bahwa terdapat korelasi negatip pendapatan saham antara saham-saham di bursa Filipina dan Indonesia.*

*Keywords:* Philippine Stock Exchange; Indonesian Stock Exchange;international diversivication; multivariate discriminant analysis; selected financial accounting variables

## Introduction

Utami (1995) noted a considerable increase in international investment since the global market was established. Investors have aimed to get the highest return at a certain risk level, or the lowest risk at a certain return level, by diversifying their investment activities internationally. Moreover, investors believe that by di versifying internationally, they can enjoy such benefits as reduction of market risk (systematic risk) and an enhancement of investment returns. Bart (1992) indicated that risk reduction through international diversification arises because the stock markets in the world's national economies do not all rise and fall in perfect unison.

As a result of current aggressive financial market globalization, investors diverted their investment strategies to potential stock markets away from the more developed countries. The Asian Pacific stock markets have been cited as alternative financial interests for international diversification strategies owing to their significant developments. According to Pudjiastuti and Husnan (1994), US investors' considered diversification into some Asian Pacific stock markets very effective in reducing risk. This is mainly because the correlations between foreign exchange (i.e., the US dollar) change, and because the market index changes on some markets were negative. Hence, this could imply that international diversification of a portfolio is beneficial in reducing the risk[2]. Moreover, the correlations between market returns on those markets, after converted into US dollar, were very low or even negative.

The liberalization and the return to positive growth of the economies of developing countries have provided fund managers in developed countries with some opportunity to further diversify their portfolios. Results of empirical studies confirm the benefits expected from portfolio diversification. Bart (1992) indicated that research has shown that the return from portfolios containing equities of a

[2] The Capital Asset Pricing Model (CAPM) defines risk as the covariability of the security's returns with the market's returns. Risk is the volatility of the security's returns relative to the volatility of the market portfolio's returns. There are two kinds of risk: systematic and unsystematic. Systematic, or market related, risks are caused by socioeconomic and political events that affect the returns of all assets and cannot be diversified away. It is an estimate of how the expected returns from an asset or portfolio will move relative to the returns from the market portfolio. The CAPM designates systematic risk as beta ($\beta$). On the other hand, risk that can be eliminated is called unsystematic, or non-market related, risk because it is caused by changes that are specific to the firm issuing the security. Unsystematic risks include uncertainties that can be diversified away and are not relevant to the investors' forecasts of future return (Harrington, 1987).

number of diverse types of companies is typically less risky than the return from portfolios with the same number of similar types of companies. From the international perspective, there are greater benefits in investing in different industries in different countries than in different industries in the same country (Pudjiastuti and Husnan, 1994).

Recently, however, the issue of emerging stock markets has become more heated in international diversification. According to the International Finance Corporation (IFC), all stock markets in developing countries are considered as emerging stock markets, where most low and middle income economies are classified as developing economies or countries[3].

The Philippine and Indonesian Stock Exchange are classified as emerging stock markets. Although both stock markets are classified as emerging markets, they are different in some characteristics, such as in economic and financial policies as well as in cultural background. According to Pudjiastuti and Husnan (1994), the coefficient correlation between the Philippine Stock Exchange (PSE) and Indonesian Stock Exchange (ISE) after being converted to US dollar was -0.280. This implies that greater benefits could be derived in diversifying investment portfolio in the PSE and ISE. Hence, before investing in both stock markets as a means to diversification, one has to know if there are in differences between the two stock markets.

So far, studies concerning international diversification have focused on developed countries. Empirical studies are mainly from developed capital markets, such as the United State and the United Kingdom. However, the findings made were inconclusive due to methodological shortcomings. Focusing on developing countries such as the Philippines and Indonesia, this study may provide a contribution to the somewhat limited literature.

Two of the more significant variables, in which these stock markets could be differentiated, are in terms of the financial performance as reflected in financial accounting ratios, and in systematic risks of the stocks among the listed firms. Although research concerning this aspect of international diversification is limited, there have been a number of studies concerning the significance and usefulness of financial accounting information in investment decisions. Accounting income figures convey information about the risk of an asset (Gonedes , 1973; Wong-Boren and Barnett, 1984; Echanis, 1985; Holthausen and Larcker, 1992; Mendoza, 1994). Ou and Penman (1989) and Ou (1990) predicted future earnings and Estep (1987) forecasted returns through a T-Model using financial information. Chun and Ramasamy (1989) believe that different accounting data which result from various corporate financial decisions may contain information about the magnitude of the systematic risk of a common stock.

Furthermore, financial information can predict the earnings per share of a stock (Griffin, 1976; Pineda, 1986 ) and changes in future earnings (Machfoedz, 1995). Thus, it is one of the base for investment decisions (Depositario and Narido, 1993). For Ball and Brown (1968), accounting earnings as reflected in financial information are valued positively by investors, and financial information can

[3] IMF (1992), " Developing Country Stock Markets, Eastern Europe Discussed at EEA Meeting," *IMF Survey*, October 26th, p. 322-323, as cited by Utami (1995).

be used to assess firm value (Depositario and Narido, 1993). Financial characteristics could be reflected by some financial dimensions (Stevens, 1973). In recent years, a considerable amount of research has been directed toward an analysis of the predictive power of financial ratios on firm bankruptcy (Altman, 1968; Ohlson, 1980; Valcarcel, 1984; Holmen, 1988). According to Echanis (1985), financial statement and accounting information occupy an important place in many security selection decisions, Chun and Ramasamy (1989) and others (Hamada, 1972; Gonedes, 1973; Melicher, 1974; Beaver and Manegold, 1975; Belkaoui, 1978; Hill and Stone, 1980; Dhingra, 1982; Mandelker and Rhee, 1984) cited that differences in systematic risk between firms are the result of differences in corporate financial decision.

On the other hand, investment decisions could be influenced by the systematic risk of a stock. Francis (1991) cited that systematic market movements could determine investment values. He cited, "...but systematic risk affects all stocks in the market because it is undiversifiable. Portfolio theory therefore suggests that only the undiversfifiable or systematic risk is worth avoiding". Francis further explains:

> *In the search for individual assets that will minimize their portfolio's risk exposure at a given level of expected return, investors tend to focus on each asset's undiversifiable systematic risk. They will bid up the prices of assets with low systematic risk that is, low beta coefficients. In contrast, assets with high beta coefficient will experience low demand and market prices that are low relative to the assets' income. Stated differently, assets with high levels of systematic risk will tend to have high expected returns.*

It has also been observed that studies supporting this premise are very limited. In the same manner, little empirical evidence on the association between accounting ratios and securities risks, particularly systematic risk (beta), has been undertaken . In this respect, a study of the PSE and ISE experiences will be able to provide additional evidence in the area of study.

This article attempts to explore differences between the PSE and the ISE in terms of selected financial accounting variables and securities systematic risk of some listed firms. In the final analysis, it aims to determine the financial accounting variables that can discriminate between the two stock markets, and which are important in making sound international investment portfolio decisions .

## Some Current Developments in the Philippine and Indonesian Stock Exchange

This section will provide us with an understanding of the developments that have occurred in the PSE and ISE. Both countries have undergone significant changes that resulted in the present conditions of these stock markets.

### *The Philippine Stock Exchange (PSE)*

The surge in capital inflows currently being experienced by the Philippines was a result of external and internal factors. According to Lamberte (1994), the government introduced major reforms in almost all areas of the economy during the 1986-1994 period. These were in the fiscal sector, financial market, foreign exchange market, and the capital market. In Lamberte's opinion, four major policy re-

forms have been introduced that have a direct bearing on capital market development. *First*, the double taxation of dividend income was eliminated through the abolition of the tax on intercorporate dividends, and the gradual phase out of the tax on shareholder's dividend income. *Second*, the Securities Exchange Commission (SEC) formally issued in October 1989 the "Rules and Regulations Governing Investment Companies", signalling the revival of mutual funds. *Third*, as part of the foreign exchange deregulation program, rules and regulations approved by the Central Bank covering foreign investments securities have been relaxed. Under the new rules, some of the functions of the Central Bank have been downloaded to the custodian banks to reduce red tape. With the new regulations, a foreign investor can immediately place his investment in Central Bank- approved securities; previously Central Bank approval was required, which usually took several weeks. Furthermore, without prior Central Bank approval, an authorized agent bank may sell and remit the equivalent foreign exchange representing sales/divestment proceeds or dividends/interests of duly registered foreign investment. Brokers have pointed out that transactions related to foreign investment in Central Bank-approved securities can now be settled in 3 to 4 days compared to 4 to 6 months under the old rules and regulations. *Fourth*, the two stock exchanges in the Philippines had been recently unified, thereby eliminating some inefficiencies (e.g., price arbitrage) in the stock market by having two stock exchanges listing the same share. All these new rules and regulations have facilitated the improvement of the PSE and the inflow of portfolio investment into the country.

Table 1 below shows the numbers of listed companies, market capitalization, trading value, and composite index of the PSE from 1987 to 1994. As of 1987, there

Table 1. **Number of Listed Companies, Market Capitalization, Trading Values and Composite Index of the Philippiness Stock Exchange (1987 - 1994)**

| Year | No. Listed Companies | Market Capitalization (in million pesos) | Trading Value (in million-pesos) | Composite Index |
|---|---|---|---|---|
| 1987 | 140 | 681,901.770 | 31,345.098 | 816.21 |
| 1988 | 142 | 681,402.208 | 18,251.238 | 839.00 |
| 1989 | 144 | 2,174,461.997 | 50,729.694 | 1,110.64 |
| 1990 | 153 | 2,346.899.045 | 28,468.473 | 653.11 |
| 1991 | 161 | 2,829,258.165 | 39,407.151 | 1,154.26 |
| 1992 | 169 | 4,640,019.041 | 77,031.718 | 1,272.40 |
| 1993 | 178 | 7,205,034.876 | 182,179.675 | 3,241.86 |
| 1994 | 189 | 13,985,439.005 | 364,296.663 | 2,785.81 |

**Source**: Philippine Stock Exchange Fact Book, 1994

were 140 listed companies on the two exchanges, with market capitalization of P681,901.770 million and trading value of P31,345.098 million. In the same year the composite index was 816.21.

As a result of the new rules and regulations in seven years (1987-1994), the list of public companies grew 35 percent, from 140 companies in 1987 to 189 companies in 1994. The increase of market capitalization for the same period was more than nineteen times, from P681,901.77 million to P13,985,439.00, million and the increase of trading value was more than ten times from P31,345.09 million to P364,296.66 million.

*The Indonesian Stock Exchange (ISE)*

In contrast with the PSE, the number of firms listed in the Jakarta Stock Exchange (JSX) remained at 24 from 1984 to 1988. It was only in 1989 that the figure increased to 57. This was mainly due to government deregulation of the capital market. This period also showed a remarkable upsurge of market capitalization. Table 1 shows the numbers of listed companies, market capitalization, trading value, turnover ratio and composite index of the JSX from 1985 to 1994.

In 1987, the Indonesian government announced a number of deregulation packages to support stock market activities. The first deregulation package was announced in December 1987 which contained the deletion of the minimum profit requirement at 10 percent of a company's equity. The ISE was then opened up to foreign investors, and foreign investors can own up to 49 percent of listed shares. The Bursa Parallel (over the counter) was opened for small and medium-size firms, and the maximum fluctuation of share

Table 2. **Number of Listed Companies, Market Capitalization, Trading Value and Composite Index of Jakarta Stock Exchange (1985-1994)**

| Year | No. of Listed Comp. | Market Capitalization (in million) | | Trading Value (in million) | | Exchange Rate | Turn-over Ratio (%) | Compo-site Index |
|---|---|---|---|---|---|---|---|---|
| | | Rupiah | US $ | Rupiah | US $ | | | |
| 1985 | 24 | 131,900 | 117 | 3,206 | 3 | 1,125.000 | 2.9 | 66.5 |
| 1986 | 24 | 132,900 | 81 | 1,816 | 1 | 1,641.000 | 1.4 | 69.7 |
| 1987 | 24 | 112,080 | 68 | 5,185 | 3 | 1,650.000 | 4.2 | 82.5 |
| 1988 | 24 | 434,178 | 253 | 6,944 | 4 | 1,717.354 | 2.5 | 305.1 |
| 1989 | 57 | 4,049,993 | 2,254 | 957,031 | 541 | 1,797.000 | 38.6 | 399.7 |
| 1990 | 125 | 15,264,600 | 8,081 | 7,318,089 | 3,992 | 1,889.000 | 75.8 | 417.8 |
| 1991 | 141 | 13,537,020 | 6,823 | 5,778,252 | 2,922 | 1,984.010 | 40.1 | 247.4 |
| 1992 | 155 | 24,839,446 | 12,038 | 7,909,164 | 3,903 | 2,063.500 | 41.2 | 274.3 |
| 1993 | 174 | 69,299,600 | 32,953 | 19,088,056 | 9,158 | 2,103,010 | 40.5 | 588.8 |
| 1994 | 230 | 103,835,241 | 47,241 | 25,488,019 | 11,801 | 2,198.000 | 29.4 | 469.6 |

**Source:** International Finance Corporation (IFC), Emerging Stock Market Factbook 1995 (Cited by Utami, 1995)

price of 4 percent was abolished (Bapepam: *Leaflet*, as cited by Utami, 1995).

In October 1988, the Indonesian government announced the second package, mostly covering banking sectors. By simplifying licensing requirements for banks, it supported the development of the stock market, since this was the chosen source of funds for private banks. In addition, this package introduced a tax burden on time deposits of 15 percent, encouraging investors to invest in stock market. The third packages was announced in December 1990 supporting the stock market, in such aspects as the clearance agency, Reksa Dana, and the investment manager. As a result of these packages of regulations over six year period (1988-1994), the list of public companies grew more than ninefold, from 24 companies in 1988 to 230 in 1994. The market capitalization increased more than two hundred times from Rp 434,178 million or US$ 253 million in 1988, to Rp 103,835 billion or US$ 47,241 million in 1994, while trading value soared more than three thousand times from Rp 6,944 million or US$ 4 million in 1988 to Rp 25,488 billion or US$ 11,801 million in 1994. During the same period (1988-1994), turnover ratio (total trading volume divided by number of listed shares or total trading value divided by market capitalization) swelled from 2.5 percent to 29.4 percent.

Furthermore, since the oil price crisis of 1971, the Indonesian government has induced the private sector to work together to support the continuity of economic development. To this end, the government has issued several packet policies for deregulation and elimination of bureaucracy in order to reactive the capital market. In 1988, a year after the president of Indonesia issued a decree to reactive the capital market, the government issued three packets on October 27, 1988, November 21, 1988, and December 1988 — which introduced policies to deregulate banks, ocean transportation, and the capital market respectively (Machfoedz, 1995).

To increase the participation of the private sectors in the capital market, the government issued Presidential Decree No.53/President/1990 concerning the capital market on 10 November 1990. The decree states that the capital market is an important alternative resource for mobilizing public funds needed to continue national economic development, and invites the public to own company shares with the purpose of distributing the national income throughout the society.

Even though the intervention in the capital market has been relaxed by the issue Presidential Decree No.53-1990 and Finance Minister Decree No.1548/KMK.013/1990 to privatize the capital market, the government still influences the capital market. An example of this influence is the fact that companies listed in the JSX voluntarily report the same financial ratios required by state-owned companies, including earnings per share, current ratio, profit margin, return on assets, return on equity, inventory turnover, debt equity ratio, sales to assets ratio, and sales to equity ratio (Business Indonesia August 10, 1993, as cited by Machfoedz, 1995).

## *Research Problem*

The central purpose of this study is to compare certain Philippine and Indonesian common stocks in terms of selected financial accounting ratios, and the systematic securities risks of some listed firms. Specifically, this paper aims to answer the following questions: (1) What financial accounting ratios are important discriminators between the PSE and ISE? (2) Is

there any difference in systematic securities risks between Philippine and Indonesian common stocks? (3) Is there a relationship between and systematic securities risk and financial accounting variables in some Philippine and Indonesian common stocks?

### *Objectives of the Study*

The objectives of this article, based on the Philippine and Indonesian experience, are: (1) to determine, examine and test what financial accounting ratios are the important discriminators for Philippines and Indonesian common stocks, (2) to determine whether there is any difference in systematic securities risk of some Philippine and Indonesian common stocks, (3) to examine and test whether there is a relationship between systematic securities risk and financial accounting ratios in some Philippines and Indonesian common stocks.

### *Significance of the Study*

Knowing the discriminant factors of financial accounting ratios and differences in systematic securities risk in both Philippine and Indonesian common stocks is obviously crucial for both firm and individual investment decisions. This can help in determining a more profitable stock investment portfolio. As earlier stated, Pudjiastuti and Husnan (1994), Lamberte (1994), and Utami (1995) empirically confirmed the benefits expected from international diversification of portfolio.

Investors or prospective investors use financial data to make more profitable investment decisions, and to help assess investment potentials of various stocks in the market. In addition, knowing the association between and financial accounting variables and the market risk of the company's stocks would enable a firm to develop mechanisms to make its stocks more attractive to target investors.

Similarly, numerous empirical studies have indicated the usefulness of financial ratios that can be used as benchmarks against which to compare performance (e.g., Davidson et al., 1988; Lere, 1991). From the external user's point of view, financial ratios are used in deciding whether to purchase a company's stock, to lend cash, or to predict a firm's future financial strength. On the investor level, it improves prediction of ex-ante risk (hence portfolio selection), given information on expected operational changes. Investors could make better forecasts of systematic risk.

### *Limitations of the Study*

Certain limitations of this study are acknowledged: (1) The findings of the study may not be conclusive due to the small size of the sample firms that were analyzed. In the same manner, the random sampling methodology may also contribute to the inconclusiveness of the results. The researcher decided to choose only 20 firms in different sectors in each country and these may not represent the characteristics of the stock markets as a whole. However, for the purposes of the current research, it is seemed that such a simple process may have served the intended purpose. (2) The selection of financial accounting variables may be biased as the there is no basis as to the standard set of variables to determine systematic risk of common stocks. Variable selection was taken from past empirical studies and from existing and related financial accounting management literature. In the same manner, the treatment of two variables, financial accounting variables and systematic securities risk, as a basis for comparing the two stock markets may not reflect and capture significant differences as other determining factors exist.

## Review of Related Literature

While limited studies on financial accounting variables and systematic risks as significant determinants in international diversification portfolio exist, several empirical studies have shown the benefits of international diversification of portfolios. For one, Utami (1995) stated that global market affects the interdependency among major equity markets. She cited that international diversification is the enhancement of returns. In her study, she compased the development of the ISE with other existing emerging stock markets. She tried to compare the performance of each market and create a number of clusters from all markets for analysis based on their similarities. The markets used were those of the following 20 countries: Philippines, Indonesia, Argentina, Brazil, Chile, Colombia, Greece, India, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Portugal, Taiwan, Thailand, Turkey, Venezuela, and Zimbabwe. The variables used in the analysis were the growth of number of listed companies, market capitalization growth, trading value growth, turnover ratio, composite index growth, exchange rate growth, P/E ratio, P/BV ratio, and dividend yield growth. Utami employed discriminant analysis to compare market performance. Results determined that not all of discriminant variables reflect market performance, with only 4 of the variables analyzed relevant to predict market performance-trading value growth, market capitalization, dividend yield growth, and exchange rate growth.

Greenwood (1993, as cited by Lamberte, 1994) made some estimations with regard to investment in stocks. It was estimated that with an 60 percent U.S. and 40 percent Far East ex-Japan portfolio, returns can be increased by 1.5 percent per annum for the same level of risk, or alternatively, with an 80 percent U.S. and 20 percent Far East ex-Japan portfolio, returns can be raised by 0.75 percent per annum while risk can be reduced.

On the other hand, Pudjiastuti and Husnan (1994) studied international diversification in some Asian Pacific stock markets. From their study, they observed that securities systematic risk is significant in international diversification . Further analysis shows that some of the markets could be classified as integrated markets, some are segmented, and other as in between markets.

Haavisto and Hansson (1992) analyzed potential gains from international diversification for different Nordic investors (Danish, Finnish, Norwegian and Swedish) if they invest in all the Nordic equity markets. Three interesting empirical results were obtained from the study. *First*, it was shown that for an investor with a long investment horizon, the exchange rate risk was negligible. *Second*, the derivation of the ex post effective frontier suggests that there would have been ample scope for actually reducing risk by Nordic diversification. *Third*, the ex post optimal portfolios were extremely concentrated and included in general only Finnish and Swedish assets, which is an indication of segmented markets. The study concluded that for the period under consideration, a long-term investor would have done very well by keeping an unhedged and diversified Nordic portfolio.

In 1992, Brainard and Tobin studied the internalization of portfolios and observed that optimal portfolio diversification lowers risk premia. However, they noted that the risk-free rate was raised by more than the reduction in the risk of premium, hence, the rate of return on for-

eign equity also rose. Bart (1992) had similar observations. He indicated that diversification helps investors minimize the risks that arise from unforseen developments in the world economy, the national economy, competition and corporate management. He concluded that to achieve maximum risk-reduction, it is necessary to create a mix of securities whose returns do not move up and down together in response to the same developments. Further risk reduction is available by introducing stocks from different countries experiencing economic conditions that are different from those in the investor's home country.

The benefits of international diversification were examined over time by Madura and Soenen (1992). They compared investor perspectives and suggested that Japanese investors were likely to benefit from international diversification. On an intertemporal basis, the risk characteristics improved the most for the Swiss perspective and worsened for the US perspective. Their research results substantiated that gains from international diversification continue to exist regardless of the country perspective. Thus, there is no conclusive evidence that the gains from international diversification decrease over time.

Cosset and Suret (1995) studied the benefits of portfolio investment in the stock markets of politically risky countries, by evaluating the effects of political risk constraints on the performance of a portfolio of international stocks. They used ex-post and ex-ante portfolio selection strategies, developed to assess the gains from international diversification. Based on their empirical findings, they suggested that diversification among politically risky countries improves the risk-return characteristics of optimal portfolios.

Jones and Swanson (1995) made a study that used financial performance measure to determine whether a basic corporate strategy, portfolio management is appropriate in countries with emerging capital markets. Specifically, the study estimated and compared the risk-return relationships of 5 emerging and 3 established securities markets during the 1980s and 2 previous periods. The results of the empirical analysis showed that, for the 11 countries considered, there is no substantial difference in risk-adjusted market performance, as measured in US dollars, between established and emerging markets. Thus, according to Jones and Swanson, no support is found for the international corporate strategy known as portfolio management based on relative capital market inefficiencies.

Bruno (1995) showed that substantial advantages in risk reduction can be attained through portfolio diversification in foreign securities as well as in domestic common stocks. The total risk of a portfolio will depend not only on the number of securities included in the portfolio, but also on the riskiness of each individual security and the degree to which these risks are independent. The gains from international diversification of investment portfolios from the Japanese as well as the US perspective were analyzed by Eun and Resnick (1994). The major findings were: (1) the potential gains from international, as opposed to purely domestic diversification are much greater for US investors than for Japanese investors. For US investors , the gains accrue not so much in terms of lower risk as in terms of higher return, and vice-versa for Japanese investors; (2) using various ex-ante international investment strategies designed to control parameter uncertainty, US investors can realize

substantial gains from international diversification, can gain relatively little; (3) hedging exchange risk generally allows US, but not Japanese investors to benefit more from international diversification.

On the other hand, several authors have indicated that there is a link between market risk and financial and accounting data. Beaver, Ketter and Scholes (1970) found significant simple correlations between estimated betas and several financial variables such as dividend payout, financial leverage and earnings yield. In 1972, Hamada concluded that financial leverage had a significant positive impact on estimated betas. This conclusion was further supported by Bowman (1980) as he indicated that leverage (debt-to-equity ratio) is an important variable in issues concerning the risk of a firm and its securities. Logue and Merville (1972, as cited by Melicher, 1974) employed a multiple regression and found out that financial leverage, return on assets, and asset size variables were positively significant. Ben-Zion and Shalit (1975) considered leverage as determinant of equity risk.

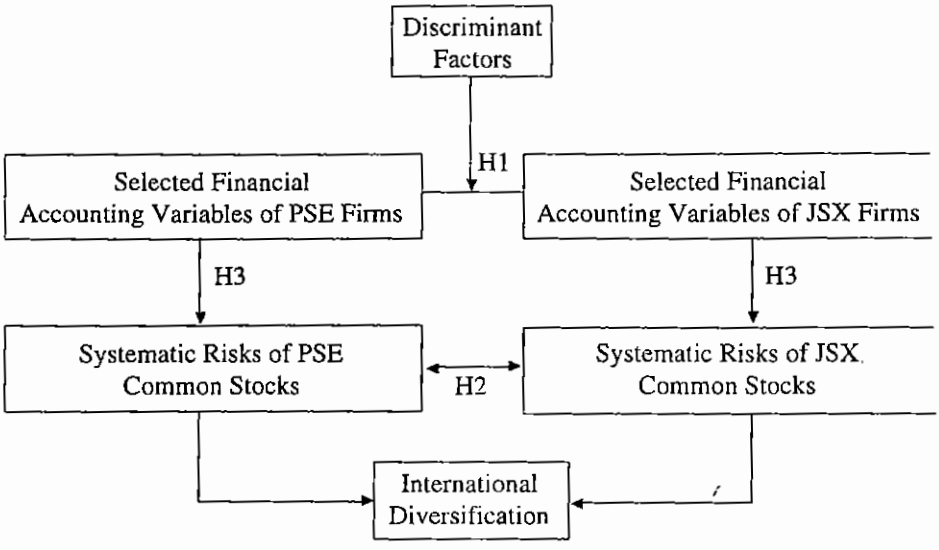
Gonedes (1973) concluded that there is a statistically significant relationship between market-based and accounting-based estimates of systematic risk. In a paper that examined firms operating in the homogeneous electric utility, Melicher (1974) found significant and positive relationships between some ratios and estimated beta. However, the study found that dividend payout ratio (earnings trend and stability) exhibited a significant negative relationship with beta.

In a follow-up study, Melicher and Rush (1974) found discouraging results since only financial leverage, earnings growth, and plant to total capitalization proved significant. A link between the firm's operating decisions and the riskiness of its stocks was established by Lev (1974) in testing three homogeneous industries. The study concluded that all other things being equal, the higher the operating leverage (i.e., the lower the unit variable costs), the larger the overall and systematic risk of the stocks. Thompson II (1976) explained the magnitude of β's in common stocks in terms of corporate risk variables derived largely from accounting data. According to Bodie, et al. (1989), liquidity and interest coverage ratios are of great importance in evaluating the riskiness of a firm's securities as these aid in assessing the likelihood of the firm's going bankrupt. These financial ratios include current, quick and interest coverage ratios.

Exploring further the link between financial accounting variables and systematic risk by using regression analysis, Chun and Ramasamy (1989) provided evidence to support the belief that financial ratios such as profitability ratio and activity ratio are important determinants of the systematic risk of a common stock. However, contrary to earlier findings and prior expectations, the relationship between leverage ratio and the estimated risks was negative. Aside from the leverage ratios, the liquidity ratios were not statistically significant variables in the study, although they followed the expected sign. Similar findings were made by Marzan (1995) when he made a similar study based on some Philippine stock experience.

To be able to show the relationships of the variable factors in the study, a conceptual framework is developed, showing indicates the formation of the hypotheses that shall be tested. Figure 1 represents the conceptualized framework.

Figure 1. **Conceptual Framework**




## Statement of Hypotheses and Methodology

In relation to the objectives of the study, four hypotheses were constructed. All hypotheses are stated in null form as follows:

1. $Ho_1$ : There are no financial accounting ratios that discriminate the PSE and ISE.
   $H1_1$ : There are financial accounting ratios that discriminate the PSE and ISE.
2. $Ho_2$ : There are no differences in systematic risk (β) between Philippine common stock and Indonesian common stocks.
   $H1_2$ : There are differences in systematic risk (β) between Philippine common stock and Indonesian common stock.
3. $Ho_3$ : There is no association between financial accounting ratios and systematic risk (β) in both the PSE and ISE.
   $H1_3$ : There is an association between financial accounting ratios and systematic risk (β) in both the PSE and ISE.

### *The Sample and the Data*

The sample included 20 firms from the PSE and 20 firms from JSX that were available on both stock exchange listings. Their inclusion satisfied the following selection criteria: (1) The company must have had monthly price information for the period January, 1990 to December, 1994, and financial profile information for the period 1990 to 1994. From all available firms in both stock exchanges, 20 firms were chosen randomly. Table 3 shows the list of firms selected as samples for the study from both stock exchanges.

Data on monthly stock prices were provided by the PSE data-base (for the Philippine stock) and by Institute for Economic and Financial Research (for the Indonesian stock). Financial accounting data were provided by the Philippine/

Table 3. **List of Samples Firm**

| Philippine Stocks | Indonesian Stocks |
|---|---|
| 1. Ayala Corporation "A" | 1. Astra Graphia |
| 2. San Miguel Corporation "A" | 2. Astra International |
| 3. A. Soriano Corporation "A" | 3. Bakrie Sumatra Plantations |
| 4. Manila Electric Company "A" | 4. United Tractors |
| 5. Philippine Long Distance Telephone Co. | 5. Praxair Indonesia (SP Gas) |
| 6. EEI Corporation | 6. Hero Supermarket |
| 7. Republic Glass Holding Corporation "A" | 7. Aqua Golden Mississippi |
| 8. Bacnotan Cons. Industries, Inc. | 8. Central Proteina Prima |
| 9. First Phil. Holdings Corporation "A" | 9. Dharmala Agrifood (TPF) |
| 10. AGP Industrial Corporation "A" | 10. International Nickel Indonesia |
| 11. Altas Cons. Mng. & Dev. Co. A | 11. Petrosea |
| 12. Ayala Land Inc. "B" | 12. Utrajaya Milk Industry |
| 13. SM Fund Inc. "A" | 13. Mayora Indah |
| 14. Philex Mining Corporation "A" | 14. Gudang Garam |
| 15. RMF Corporation | 15. Hanjaya Mandala Sampoerna |
| 16. Benguet Corporation "A" | 16. Metrodata Electronics |
| 17. Basic Pet. & Miniral, Inc. "A" | 17. Tigaraksa Satria |
| 18. Bacnotan Cement Corporation | 18. Gadjah Tunggal |
| 19. Purefoods Corporation "A" | 19. PanBrathers Tex |
| 20. Sime Darby Pilipinas, Inc. | 20. Indah Kiat Pulp & Paper Co. |

Makati Stock Exchange Handbooks: Investment Guide (for the Philippine firms) and by Institute for Economic and Financial Research (for the Indonesian firms). The financial ratios were calculated from financial statements. The financial ratios are those commonly used and understood by the general investment community or are well known in financial economics, as well as those widely used in previous research on risk and similar analysis (Chun and Ramasamy, 1989; Valcarcel, 1984; Gombola and Ketz, 1983, and Echanis, 1985).

Some company financial ratios were directly obtained from the Philippine/ Makati Stock Exchange Handbooks and Institute for Economic and Financial Research, Indonesian Capital Market Directory. All ratios presented were computed on the basis of arithmetic averages from the year 1990-1994 and book values were used in all computations.

Table 4 shows the list of 20 financial ratios grouped in five (5) major categories used in the study.

### *Methodological Procedure*

This study used data from the financial statements, and data of monthly stock prices of the companies listed on the PSE and the JSX. Twenty (20) firms from each stock market were included in the sample for the years 1990, 1991, 1992, 1993, and 1994. The accounting data were taken from the firms' financial statements which, inturn were used to calculate the financial ratios. In calculating the financial ratios, 200 financial statements of the various firms were used. For the analysis, 4,000

Table 4. **Financial Ratios Included in the Tests**

| | Code |
|---|---|
| **Liquidity Ratios** | |
| Current Assets/Current Liabilities | CR |
| Quick Assets/Current Liabilities | QR |
| Current Assets/Total Asset | CATA |
| Current Liabilities/Total Asset | CLTA |
| **Leverage Ratios** | |
| Total Debt/Total Asset | TDTA |
| Total Debt/Total Equity | TDE |
| Long Term Debt/Total Assets | LDTA |
| Long Term Debt/Total Equity | LDE |
| **Activity Ratios** | |
| Sales/Iventory | ITO |
| Sales/Total Assets | TATO |
| Sales/Accounting Recievables | ARTO |
| Sales/Networth | NWTO |
| **Profit Ability Ratios** | |
| Gross Profit Margin | GPM |
| Net Profit Margin | NPM |
| Return on Investment | ROI |
| Return on Equity | NPTL |
| **Capital Market Ratios** | |
| Price Book Value | PBV |
| Dividend Yields | DY |
| Price Earning Ratio | PER |
| Devidend Payout Ratio | DPR |

ratio values were computed and calculated from twenty two (22) financial ratios. Monthly stock prices and composite indices were used to calculate systematic risk ($\beta$). Data processing and statistical analysis utilized the Statistical Package for Social Sciences (SPSS) integrated system computer program.

### *Testing Hypothesis 1 with Multiple Discriminant Analysis (MDA)*

To test the first hypothesis, multiple discriminant analysis (MDA) was used to investigate empirically the characteristics of the two groups of firm samples and to develop the classification and prediction model using financial accounting ratios as independent variables. Discriminant analysis involves deriving a *variate*[4], the linear combination of the two (or more) independent variables that will discriminate best between a *priori* defined groups. Discrimination is achieved by setting variate weights for each variable to maximize the between-group variance relative to the within-group variance. The linear

[4] Also called linear combination, linear compound, and discriminant function, it represents the weighted sum of two or more independent variables (Hair et al, 1995)

combination for a discriminant analysis, also known as discriminant function, is derived from an equation that takes the following form (Hair et al., 1995):

$$Z = W_1X_1 + W_2X_2 + W_3X_3 + ... + W_nX_n$$

where:

$Z$ = discriminant score
$W_i$ = discriminant weight for independent variables *i*
$X_i$ = independent variable *i*.

In the process of deriving a discriminant function, the following statistical measures are also computed: eigenvalue, canonical correlation, Wilkes' lambda ($\lambda$), chi-square ($x^2$) and its significant level and the *F*-value. The eigenvalue measures the relative importance of the discriminant function. It measures the total variance existing in the discriminating variables. Therefore, the higher the eigenvalue, the more significant the function. The canonical correlation is a measure of association between the single discriminant function and the set of (*g-1*) dummy variables which define the *g* group memberships. It tells us how closely the function and the group variable are related, which is another measure of the function's ability to discriminate among groups. The eigenvalue and its related canonical correlation denote the relative ability of the function to separate groups. The higher the value, the greater the ability of the function is. Wilks' lambda ($\lambda$) is an inverse measure of the discriminating power in the original variables which has not yet been removed by the discriminant function. Lambda ($\lambda$) can be corresponding significance level of the model occurring due to chance (Nie, 1975, as cited by Valcarcel, 1984).

### *Computation of a Security's Systematic Risk and Testing Hypothesis 2*

In calculating an individual security's systematic risk, the basic methodology adopted drew much from Tandelilin (1996), Marzan (1995), Machfoedz (1995), and Chun and Ramasamy (1989) in estimating systematic risk. The data analysis involves three stages: The first stage of the analysis determined the parameter of individual stock returns ($R_i$) and market return ($R_m$). For each of the selected stocks, monthly closing prices were obtained. Using these closing stock price quotations, monthly returns were computed for the *i*-th securities as follows:

$$R_{it} = ( P_{i,t} - P_{i,t-1} ) / P_{i,t-1}$$

where:

$P_{it}$ and $P_{i,t-1}$ represent the prices for current *t* and previous *t-1* months for the *i*-th stock. All stock prices were adjusted for stock dividends and stock splits.

To determine market return ($R_m$), the monthly composite index were computed as follows:

$$R_{m,t} = ( R_{m,t} - R_{m,t-1} ) / R_{m,t-1}$$

where:

$R_{m,t}$ and $R_{m,t-1}$ represent the composite index the of PSE and JSX for current *t* and previous *t-1* month.

The second stage estimates the beta coefficient (systematic risk) of the individual stock. Although beta coefficient may not provide an adequate measure of the total risk of a portfolio (Sharpe and Cooper, 1972), majority of the variation in return is attributable to changes in return

on the market and beta will thus provide a good measure of risk. To determine the beta coefficient of a stock, the following model of return-generating process showing linear relationship between the rate of return on stock $i$, $R_{it}$, and the market return, $R_{imt}$ for period $t$ were used. This is the market model from the popular capital asset pricing model:

$$R_{it} = \alpha_i + {}_i R_{mt} + \varepsilon_{it}$$

where:

$E_{it}$ residuals during period t such that E $(\varepsilon_{it}) = 0$, and Variance of $\varepsilon_{it} = \sigma^2_i$ and Cov $(\varepsilon_{it}, \varepsilon_{jt}) = 0$, Cov $(\varepsilon_{it}, R_{mt}) = 0$

Finally, this is followed by the estimation of the systematic risk, $\beta_i$ which is computed as follows:

$$\beta_i = [\sum_{i=1}^{n}(R_{it} - R_i)(R_{mt} - R_m)]/[\sum_{i=1}^{n}(R_{mt} - R_m)^2]$$

where:

$R_j$ = the mean of $R_{it}$

$R_m$ = the mean of $R_{mt}$ parameters determine the parameters of the systematic risk or beta ($\beta$).

The resulting computations of the systematic risk formed the input for testing whether there is a difference between the systematic risks in both stock exchanges. Following the computation of the systematic risks, hypothesis 2 is tested. In determining the difference in systematic risk between the Philippine common stocks and the Indonesian common stocks, the statistical tool to be used is the *independent-sample t-test.*

***Testing Hypothesis 3 with Multiple Regression***

To test the whether there is a relationship between systematic risk and financial accounting variables, the general multiple regression model was used, as follows:

$$\beta_i = \alpha_i + \sum_{j=1}^{20} \alpha_j X_j + \varepsilon i$$

where:

$a_j$ (j =1.2,....20) = the coefficient of the $i$th selected financial accounting variables

$X_j$ = changes in financial accounting ratios

Backward-elimination procedures were used to find the significant variables that entered in this model. Although backward-elimination procedures cannot solve the problem of multicollinearity, this procedure can select all significant variables. There are two methods to test for multicollinearity: eigenvalues and variance inflation factor (VIF), the latter being used in this study. If multicollinearity were found, ratios that had same degree of multicollinearity were dropped from the model. Statistically, common practice is that a variance inflation factor (VIF) of more than ten would exclude a ratio (Machfoedz, 1994).

## Findings, Analysis and Discussion

Based on the analysis of computed financial accounting ratios and systematic risk ($\beta$) using the statistical tools describle findings are as follows:

### *Hypothesis 1*

To determine whether financial accounting variables exist that could discriminate between the PSE and the ISE, discriminant analysis was employed. Two groups of samples were tested based on their 20 financial accounting ratios. In this analysis, the dependent variable is stock exchange (PSE and JSX) and the independent variables (discriminant variables) are the 20 financial accounting ratios (see Table 4). Table 5 provides the overall step-by-step discriminant analysis results after

Table 5. **The Results of Discriminant Analysis with Financial Accounting Variables as Discriminant Variables**

**Summary Table**

| Step | Action Entered | Removed | Vars in | Wilks' Lambda | Sig. | Minimum D Squared | Sig. | Between Groups | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | PBV | | 1 | .49091 | .0000 | 3.94071 | .0000 | 1 | 2 |
| 2 | LDE | | 2 | .38648 | .0000 | 6.03227 | .0000 | 1 | 2 |
| 3 | DPR | | 3 | .31213 | .0000 | 8.37441 | .0000 | 1 | 2 |

Classification function coefficients
(Fisher's linear discriminant functions)

| Group = | 1 | 2 |
|---|---|---|
| DPR | 29.1234458 | 53.8778354 |
| LDE | 5.0123886 | 1.0701956 |
| PBV | .4294038 | .1103889 |
| (Constan) | -7.1532692 | -6.4982091 |

**Canonical Discriminant Functions**

| Fcn | Eigenvalue | Pct of Variance | Cum Pct | Canonical Corr | After Fcn | Wilks' Lambda | Chi-square | df | Sig |
|---|---|---|---|---|---|---|---|---|---|
| 1* | 2.2038 | 100.00 | 100.00 | .8294 | 0 | .312130 | 42.498 | 3 | .0000 |

* Marks the 1 canonical discriminant functions remaining in the analysis.

Standardized canonical discriminant function coefficients

| | Func 1 |
|---|---|
| DPR | -.53279 |
| LDE | .55281 |
| PBV | .77112 |

all the significant discriminators have been included in the estimation of the discriminant function.

The results of the test showed that, based on Wilks' lambda and minimum $D^2$ values from 20 independent financial accounting variables (discriminant variables), only three financial accounting variables entered the model and were significant discriminators. These discriminant variables are dividend payout ratio (DPR), long term-debt to total equity (LDE), and price to book value (PBV). These variables can therefore be used to discriminate between the PSE and the JSX. Based on the results, the 17 other variables are not significant discriminators because their means of both groups are either very similar or insignificantly different. The price to book value and long-term debt to total equity of the PSE (group 1) are significantly higher than the JSX (group 2). On the other hand, the JSX has higher dividend payout ratio than the PSE. There are two components to a stock's return: the dividend and the capital gain. Since the stock price composite index of the PSE is higher than that of the JSX (see Table 1 and Table 2), it seems that investors on the PSE prefer capital gains to dividends. This is also supported by the lower dividend payout ratio of the PSE compared to that of the JSX. This may imply that the PSE pays less dividend to investors.

The following is the result of the standardized canonical discriminant function coefficient of the discriminant analysis:

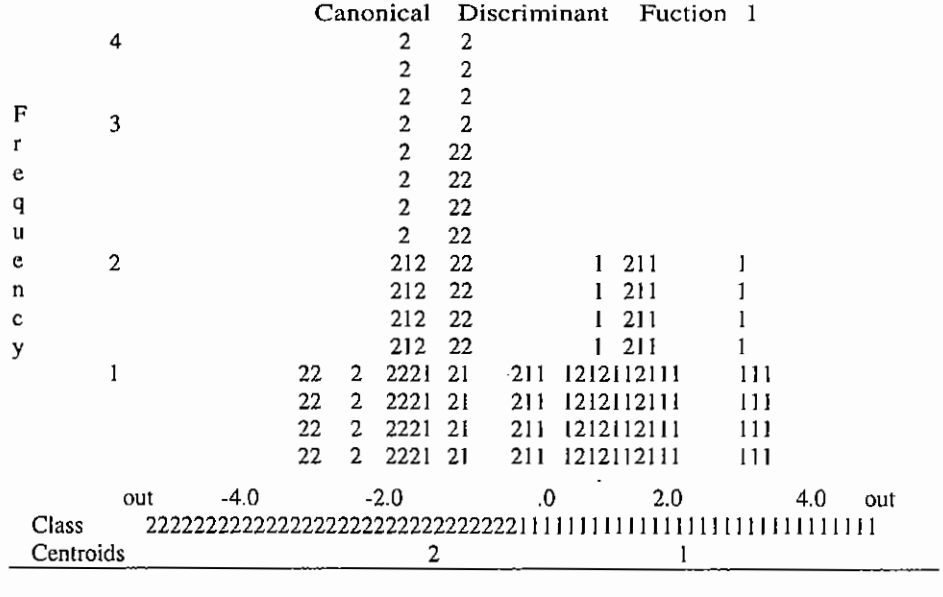
$$Z = -0.53279\ X_1 + 0.55281\ X_2 + 0.77112\ X_3$$

where:

$X_1$ = dividend payout ratio (DPR)
$X_2$ = long term-debt to total equity (LDE)
$X_3$ = price to book value (PBV).

The multivariate aspects of the model are reported under the heading "Canonical Discriminant Functions." The summary table shows that the discriminant

Figure 2. **All-groups Stacked Histogram**



function is highly significant (.0000) and displays a canonical correlation of 0.8294. This correlation can be further interpreted by squaring it $(0.8294)^2 = 0.6879$. It could be concluded that 68.79 percent of the variance in the dependent variable (Z=Country) can be accounted for (or explained) by this model, which includes only three discriminant (independent) variables.

Figure 2 and Table 6 and 7 present the classification of the cases. The classification result indicates that 77.5 percent of the cases are classified correctly. Predicted group membership shows the 15 cases (75%) are classified correctly into group 1 (the PSE) and 16 cases (80%) into group 2 (the JSX).

From the 40 firms analyzed, no firms could be classified perfectly into a specific group. Moreover, there are some firms which tend to fall into both groups. In this case, the classification is based on the modus of the cases in each group. The firms that were classified in more than 50% of the cases to one of the two groups (group 1 or 2) were classified into that group. The final result are presented in Table 7.

### *Hypothesis 2*

Hypothesis 2 deals with the difference in systematic risk (β) between the PSE and the JSX. To test this hypothesis, an independent-sample t-test was used. From Table 8, the result showed that the mean of systematic risk of the PSE is 1.5230 and the mean of systematic risk of the JSX is 0.7367. The T-value of -4.25 shows that the difference between the systematic risks between the two stock exchanges significant at 0.01, indicating that there is a significant difference in systematic risk between the two stock markets. The positive sign indicates that the average, systematic risk for the PSE was higher than that for the JSX.

### *Hypothesis 3*

Hypothesis 3 was designed to answer the alternative hypothesis that there is an association between financial accounting ratios and systematic risk (β) in both the PSE and the JSX. Table 9 presents the statistical results of the multiple regression for the PSE.

The results showed that of twenty (20) financial accounting ratios, only three (3) financial ratios were significant at 0.05 level in the PSE. These ratios were price to book value (PBV), long term-debt to total asset (LDTA), and return on equity (ROE), representies capital market ratio, leverage ratio, and profitability ratio, respectively. The signs of all regression coefficients were consistent with a *priori* expectation.

Table 9 shows adjusted R-square equal to 0.2126, indicating that all three variables taken together were able to explain only 21.26 percent of the total variability of the dependent variable which is the systematic risk (β). On the whole equation, it showed an F-value of 5.6876 which was significant at 0.01 level. Therefore, there is significant relationship between financial accounting ratios and systematic risk (β) in the case of the PSE.

Table 10 shows the results of multiple regression analysis between financial accounting ratios and systematic risk (β) in the case of the JSX. From twenty (20) financial accounting ratios, six (6) ratios were significant at 0.05 level. There was a mixed result for profitability ratios, however, in terms of a *priori* expectations . These ratios were expected to have a negative relationship to systematic risk (β). From the two profitability ratios which were significant, only gross profit margin (GPM) had a negative relationship to sys-

Table 6. **Classification Data for Two Group Discriminant Analysis**

| Case Number | Mis Val | Sel | Actual Group | Highest Probability Group | P(D/G) | P(G/D) | 2nd Highest Group | P(G/D) | Discrim Scores |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 1 | 1 | .8154 | .9710 | 2 | .0290 | 1.2135 |
| 2 | | | 1 | 1 | .8376 | .9917 | 2 | .0083 | 1.6520 |
| 3 | | | 1 | 1 | .9469 | .9819 | 2 | .0181 | 1.3803 |
| 4 | | | 1 | 1 | .9158 | .9798 | 2 | .0202 | 1.3412 |
| 5 | | | 1 | 1 | .0920 | .9999 | 2 | .0001 | 3.1317 |
| 6 | | | 1 | 1 | .0459 | 1.0000 | 2 | .0000 | 3.4435 |
| 7 | | | 1 | 1 | .2876 | .7521 | 2 | .2479 | .3835 |
| 8 | | | 1 | ** 2 | .2469 | .6601 | 1 | .3399 | .8445 |
| 9 | | | 1 | 1 | .4358 | .9984 | 2 | .0016 | 2.2263 |
| 10 | | | 1 | 1 | .6853 | .9532 | 2 | .0468 | 1.0417 |
| 11 | | | 1 | ** 2 | .2161 | .6798 | 1 | .3207 | 2.9766 |
| 12 | | | 1 | 1 | .7841 | .9675 | 2 | .0325 | 1.1730 |
| 13 | | | 1 | ** 2 | .2220 | .6577 | 1 | .3423 | -.2256 |
| 14 | | | 1 | 1 | .5309 | .9148 | 2 | .0852 | .8203 |
| 15 | | | 1 | 1 | .1388 | .9998 | 2 | .0002 | 2.9271 |
| 16 | | | 1 | 1 | .5691 | .9971 | 2 | .0029 | 2.0163 |
| 17 | | | 1 | ** 2 | .1750 | .5653 | 1 | .4347 | -.0907 |
| 18 | | | 1 | 1 | .6587 | .9958 | 2 | .0042 | 1.8887 |
| 19 | | | 1 | ** 2 | .4954 | .9015 | 1 | .0985 | -.7652 |
| 20 | | | 1 | 1 | .9099 | .9892 | 2 | .0108 | 1.5600 |
| 21 | | | 2 | 2 | .5537 | .9223 | 1 | .0777 | -.8547 |
| 22 | | | 2 | 2 | .3176 | .7850 | 1 | .2150 | -.4475 |
| 23 | | | 2 | 2 | .3065 | .9992 | 1 | .0008 | -2.4695 |
| 24 | | | 2 | 2 | .6811 | .9525 | 1 | .0475 | -1.0359 |
| 25 | | | 2 | ** 1 | .4387 | .8750 | 2 | .1250 | .6726 |
| 26 | | | 2 | 2 | .1648 | .9997 | 1 | .0003 | -2.8359 |
| 27 | | | 2 | 2 | .6996 | .9951 | 1 | .0049 | -1.8328 |
| 28 | | | 2 | 2 | .8960 | .9897 | 1 | .0103 | -1.5776 |
| 29 | | | 2 | ** 1 | .4242 | .7898 | 2 | .2102 | -3.0265 |
| 30 | | | 2 | 2 | .5421 | .9974 | 1 | .0026 | -2.0566 |
| 31 | | | 2 | 2 | .8718 | .9906 | 1 | .0094 | -1.6083 |
| 32 | | | 2 | 2 | .6953 | .9951 | 1 | .0049 | -1.8387 |
| 33 | | | 2 | ** 1 | .3249 | .7796 | 2 | .2204 | -1.0950 |
| 34 | | | 2 | 2 | .9845 | .9858 | 1 | .0142 | -1.4664 |
| 35 | | | 2 | 2 | .5312 | .9149 | 1 | .0851 | -.8207 |
| 36 | | | 2 | 2 | .8514 | .9912 | 1 | .0088 | -1.6343 |
| 37 | | | 2 | ** 1 | .7678 | .7552 | 2 | .2448 | -1.4497 |
| 38 | | | 2 | 2 | .8812 | .9902 | 1 | .0098 | -1.5963 |
| 39 | | | 2 | 2 | .5976 | .9346 | 1 | .0654 | -.9191 |
| 40 | | | 2 | 2 | .6881 | .9537 | 1 | .0463 | -1.0455 |

** indicates misclassification

Table 7. **Classification Results**

| Actual Group | Number of Cases | Predicted Group Membership | |
|---|---|---|---|
| | | Group 1 | Group 2 |
| Group 1 | 20 | 15 (75%) | 5 (25%) |
| Group 2 | 20 | 4 (20%) | 16 (80%) |

Note : 77.5% of the cases are classified correctly

Table 8. **Test Result of Differences Between the Philippine Stock Exchange and the Jakarta Stock Exchange in Their Systematic Risk**

t-tests for independent samples of GROUP

| Variable | Number of Cases | Mean | SD | SE of Mean |
|---|---|---|---|---|
| BETA | | | | |
| GROUP 1 | 20 | .5230 | .509 | .114 |
| GROUP 2 | 20 | .7367 | .652 | .146 |

Mean Difference = .7863

Levene's Test for Equality of Variances: F= .640 P= .429

t-test for Equality of Means 95%

| Variances | t-value | df | 2-Tail Sig | SE of Diff | CI for Diff |
|---|---|---|---|---|---|
| Equal | 4.25 | 38 | .000 | .185 | (.412, 1.161) |
| Unequal | 4.25 | 35.90 | .000 | .185 | (.411, 1.161) |

Table 9. **Test Results of Multiple Regression with Financial Accounting Ratios as Independent Variables and Systematic Risk (β) as Dependent Variable for the Philippine Stock Exchange**

***MULTIPLE REGRESSION***

Equation Number 1 Dependent Variable.. BETA

Variable(s) Removed on Step Number
38.. TDE

| | |
|---|---|
| Multiple R | .5190 |
| R Square | .2693 |
| Adjusted R Square | .2126 |
| Standard Error | .3342 |

Analysis of Variance

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 3 | 1.3432 | .61099 |
| Residual | 16 | 2.9867 | .17547 |

F = 5.68758 Signif F = .0116

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| PBV | -1.345674 | .657483 | -.324250 | -4.764 | .0000 |
| LDTA | 1.477893 | .764547 | .332420 | 2.048 | .0511 |
| ROE | -.025434 | .006534 | -.456340 | -2.698 | .0096 |
| (Constant) | .406334 | .144924 | | 4.134 | .0000 |

tematic risk (β). This finding was consistent with a *priori* expectation. However, a positive relationship was found between return on investment (ROI) and systemat' risk (β), not consistent with prior expect tions.

The results of leverage ratios, activity ratios, liquidity ratios and capital market ratios were consistent with a *priori* expectation. For leverage ratio, a positive relationship was found between total debt to equity ratio (TDE) and systematic risk (β). For activity ratio, a negative relationship was found between total asset turn over (TATO) and systematic risk (β). Similar results were obtained for liquidity ratio and capital market ratio. A negative relationship was found between gross profit margin (NPM) and systematic risk (β) which was consistent with a *priori* expectation. Relating to capital market ratio, there was a negative relationship between dividend yield (DY) and systematic risk (β), also consistent with a *priori* expectation.

Table 10 shows adjusted *R-square* equal to 0. 3435, indicating that all six variables taken together were able to explain 34.35 percent of the total variability of the dependent variable which is the systematic risk (β). On the whole equation, it showed an F-value of 7.80123 which was significant at 0.01 level. Therefore, there is a significant relationship between financial accounting ratios and estimated systematic risk in the JSX.

Table 10. **Test Results of Multiple Regression with Financial Accounting Ratios as Independent Variable and Systematic Risk (β) as Dependent Variable for the Jakarta Stock Exchange**

***MULTIPLE REGRESSION***

Equation Number 1 Dependent Variable.. BETA

Variable(s) Removed on Step Number
33.. PBV

| | |
|---|---|
| Multiple R | .69642 |
| R Square | .48500 |
| Adjusted R Square | .34347 |
| Standard Error | .33257 |

Analysis of Variance

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 4 | 2.17652 | .39068 |
| Residual | 15 | 1.31664 | .05893 |

F = 7.80123 Signif F = .0003

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| CLTA | -1.554140 | .609963 | -.627272 | -2.371 | .0239 |
| DY | -.206178 | 0.77415 | -.374163 | -2.663 | .0142 |
| GPM | -1.893678 | .707047 | -.801441 | -4.535 | .0005 |
| ROI | .086559 | .24756 | .980054 | 3.923 | 0.0007 |
| TATO | -.471748 | .189556 | -.637464 | -2.613 | .0154 |
| TDE | .428738 | .099306 | .931345 | 3.922 | .0052 |
| (Constant) | 2.051519 | .287677 | | 8.130 | .0000 |

### *Further Analysis*

Further statistical analysis shows that there is a low correlation between the PSE and ISE, with a correlation of coefficient 0.11. Table 11 shows the statistical results of the regression analysis.

The low correlation of coefficient implies that both stock markets are segmented or disintegrated. This simply indicates that for the investor's investment portfolio it is better to invest in both markets. This observation further empirically confirms Pudjiastuti and Husnan's (1994) earlier findings that, "... in segmented markets, the benefits of lessening the constraints for foreign investors could be considered the highest."

## Summary and Conclusion

The study was aimed at determining the differences between the Philippine and Indonesian stock exchanges in terms of selected financial accounting ratios and in the systematic securities risks of some listed firms. It also aimed at determining financial accounting variable discrimina-

Table 11. **Test Result of Regression Between the Composite Index of the PSE and the Composite Index of the JSX**

***REGRESSION***

| | |
|---|---|
| Multiple R | .11469 |
| R Square | .01315 |
| Adjusted R Square | .00157 |
| Standard Error | .07477 |

Analysis of Variance

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 1 | .06619 | .06619 |
| Residual | 57 | .31870 | .00559 |

F = 5.83816 Signif F = .01211

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| CI_PSE | .304863 | .088606 | .414694 | 3.441 | .0011 |
| (Constant) | -.002572 | .009937 | | -.259 | .7967 |

tors and the relationships between financial accounting ratios and systematic risks in both markets. The study was based on 20 Philippine firms and 20 Indonesian firms listed on the PSE and the JSX, respectively. The financial accounting ratios were grouped into five (5) major categories: liquidity ratios, leverage ratios activity ratios, profitability ratios and capital market ratios which calculated from financial statements. The estimation of systematic securities risk, on the other hand, was based on their individual monthly stock prices and the composite index from 1990 to 1994.

Discriminant analysis showed that there were only three (3) discriminant variables from 20 selected financial accounting variables that could classify differences between the PSE and ISE. These were dividend payout ratio (DPR), long term-debt to total equity (LDE) and price to book value (PBV). The resulting canonical discriminant function showed 68.79 percent of the variance in the dependent variable (Z=Country) can be accounted for (or explained) by this model, which includes only three discriminant (independent) variables.

The study also showed that there was a difference in systematic risk between the two stock markets. Based on results, the systematic risk of the PSE was higher than that of the JSX: the resulting systematic risks mean for the Philippine stock exchange is 1.5230 while for the Indonesian stock exchange is .7367. The mean differences could be attributed to the differences in the relationships between financial accounting variables and sys-

tematic risk in both stock exchanges. Financial accounting variables influenced systematic risks of the Philippine common stock less than the systematic risks of the Indonesia common stock. Additionally, prevailing macroeconomic variables in each country may also affect differences in systematic risks between the two stock exchanges. As previously studied (Tandelilin, 1996), macroeconomic variables (real GDP, interest rate and inflation rate) has less influence on the systematic risk of Indonesian common stocks.

Finally, the results of the study indicated that financial accounting ratios have an influence on the systematic risks of the common stocks in both the Philippines and Indonesia. This finding supported earlier studies made by Chun and Ramasamy (1989) on Malaysian evidence and Marzan (1995) based on selected Philippine common stocks. However, findings on leverage ratios are to the contrary. The studies of Chun and Ramasamy (1989) and Marzan (1995) found negative relationships between leverage ratios and systematic risks. The present study of the Indonesian experience revealed that, in line with a *priori* expectations, leverage ratios had a positive relationship on systematic risks. This finding supported earlier results made by Hamada (1972), Beaver and Manegold (1975) and Mandelker and Rhee (1984). Moreover, contrary to Chun and Ramasamy's (1989) findings, the resulting regression coefficient of the Indonesian experience was statistically significant at .0001 level. Based on the empirical findings, liquidity, profitability, activity and capital market ratios were significantly related to systematic risks. Generally, therefore, the test results indicated financial accounting ratios appeared to be more useful in determining the systematic risk of common stocks in Indonesia than in the Philippines.

Results indicated that there are significant differences between the PSE and ISE based on financial accounting variables and systematic risks. Further, analysis shows a very low coefficient of correlation between the two stock markets. This confirmed earlier observations made by Pudjiastuti and Husnan (1994) of a negative correlation between the PSE and ISE. Thus, although inconclusive, investors could make use of these two variables as determining factors in international diversification of their investments.

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